What is claimed is:

1. A phase change method of recording information on a recording medium by changing absorption coefficients of optical constants of a recording layer and a dielectric layer of the recording medium by laser induced reaction and diffusion.

2. The method of claim 1, wherein the recording layer is formed of a rare earth transition metal.

3. The method of claim 2, wherein the rare earth transition metal is TbFeCo.

4. The method of claim 4, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

5. The method of any one of claims 1 through 4, wherein the reaction and diffusion are induced at a temperature of 490-580℃.

6. The method of any one of claims 1 through 5, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer on the recording layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

7. The method of any one of claims 1 through 5, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of

AgO_x stacked, and a dielectric layer on the recording layer, laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

8. The method of any one of claims **1 through 5**, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.

9. A magneto-optical method of recording information on a recording medium by changing the magnetic spin direction in a recording layer while the recording layer and a dielectric layer of the recording medium are irradiated with laser to induce reaction and diffusion therein.

10. The method of claim 9, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer,.

11. The method of claim 9 or 10, wherein the recording layer is formed of a rare earth transition metal.

12. The method of claim 11, wherein the rare earth transition metal is TbFeCo.

13. The method of claim 9 or 10, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

14. The method of any one of claims 9 through 13, wherein the

reaction and diffusion are induced at a temperature of 400-490℃.

15. A method of recording information on a recording medium based on the physical properties of protruding record marks formed by laser induced reaction and diffusion in a recording layer and a dielectric layer.

16. The method of claim 15, wherein the recording layer is formed of a rare earth transition metal.

17. The method of claim 16, wherein the rare earth transition metal is TbFeCo.

18. The method of claim 15, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

19. The method of any one of claims 15 through 18, wherein the reaction and diffusion are induced at a temperature of 400-490℃.

20. The method of any one of claims 15 through 19, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

21. The method of any one of claims 15 through 19, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of

AgO_x stacked, and a dielectric layer on the recording layer, laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

22. The method of any one of claims 15 through 19, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer,

23. A recording medium recorded on using a phase change method of changing absorption coefficients of optical constants of a recording layer and a dielectric layer of the recording medium by laser induced reaction and diffusion.

24. The recording medium of claim 23, wherein the recording layer is formed of a rare earth transition metal.

25. The recording medium of claim 24, wherein the rare earth transition metal is TbFeCo.

26. The recording medium of claim 23, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

27. The recording medium of any one of claims 23 through 26, wherein the reaction and diffusion are induced at a temperature of 490-580℃.

28. The recording medium of any one of claims 23 through 27, wherein the dielectric layer is constructed as a sequential stack of a

protective dielectric layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, and laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

29. The recording medium of any one of claims 1 through 5, wherein the dielectric layer is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of AgO_x stacked, and a dielectric layer on the recording layer, and laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

30. The recording medium of any one of claims 23 through 27, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.

31. A recording medium recorded on using a magneto-optical method of changing the magnetic spin in a recording layer while the recording layer and a dielectric layer of the recording medium are irradiated with laser to induce reaction and diffusion therein.

32. The recording medium of claim 31, wherein the recording layer and the dielectric layer are simultaneously formed , so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.

33. The recording medium of claim 31 or 32, wherein the

recording layer is formed of a rare earth transition metal.

34. The recording medium of claim 33, wherein the rare earth transition metal is TbFeCo.

35. The recording medium of claim 31 or 32, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

36. The recording medium of any one of claims 31 through 35, wherein the reaction and diffusion are induced at a temperature of 400-490℃.

37. A recording medium recoded on using a method based on the physical properties of protruding record marks formed by laser induced reaction and diffusion in a recording layer and a dielectric layer.

38. The recording medium of claim 37, wherein the recording layer is formed of a rare earth transition metal.

39. The recording medium of claim 38, wherein the rare earth transition metal is TbFeCo.

40. The recording medium of claim 37, wherein the recording layer is formed of alloys of rare earth metal and transition metal.

41. The recording medium of any one of claims 37 through 40, wherein the reaction and diffusion are induced at a temperature of 400-490℃.

42. The recording medium of any one of claims 37 through 41,

wherein the dielectric layer is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, and laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

43. The recording medium of any one of claims 37 through 41, wherein the dielectric layer is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of AgO_x, and a dielectric layer on the recording layer, and laser light is radiated to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that information can be reproduced from the recording medium regardless of a diffraction limit.

44. The recording medium of any one of claims 37 through 41, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer,

45. An apparatus for recording information on a recording medium by a phase change method of changing absorption coefficients of optical constants of a recording layer and a dielectric layer of the recording medium by laser induced reaction and diffusion and reproducing the recorded information from the recording medium.

46. The apparatus of claim 45, wherein the recording layer of the recording medium is formed of a rare earth transition metal.

47. The apparatus of claim 46, wherein the rare earth transition metal is TbFeCo.

48. The apparatus of claim 45, wherein the recording layer of the recording medium is formed of alloys of rare earth metal and transition metal.

49. The apparatus of any one of claims 45 through 48, wherein the reaction and diffusion in the recording medium are induced at a temperature of 490-580℃.

50. The apparatus of any one of claims 45 through 49, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, information is recorded by laser irradiation to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that the recorded information can be reproduced regardless of a diffraction limit.

51. The apparatus of any one of claims 45 through 49, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of AgO_x, and a dielectric layer on the recording layer, information is recorded by laser irradiation to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that the recorded information can be reproduced regardless of a diffraction limit.

52. The apparatus of any one of claims 45 through 49, wherein the recording layer and the dielectric layer are simultaneously formed, so

that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.

53. An apparatus for recording information on a recording medium by a magneto-optical method of changing the magnetic spin direction in a recording layer while the recording layer and a dielectric layer of the recording medium are irradiated with laser to induce reaction and diffusion therein and reproducing the recorded information from the recording medium.

54. The apparatus of claim 53, wherein the recording layer and the dielectric layer of the recording medium are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.

55. The apparatus of claim 53 or 54, wherein the recording layer of the recording medium is formed of a rare earth transition metal.

56. The apparatus of claim 55, wherein the rare earth transition metal is TbFeCo.

57. The apparatus of claim 53 or 54, wherein the recording layer of the recording medium is formed of alloys of rare earth metal and transition metal.

58. The apparatus of any one of claims 53 through 57, wherein the reaction and diffusion in the recording medium are induced at a temperature of 400-490℃.

59. An apparatus for recording information on a recording medium using a method based on the physical properties of(?of forming)

protruding record marks formed by laser induced reaction and diffusion in a recording layer and a dielectric layer and reproducing the recorded information from the recording medium.

60. The apparatus of claim 59, wherein the recording layer of the recording medium is formed of a rare earth transition metal.

61. The apparatus of claim 60, wherein the rare earth transition metal is TbFeCo.

62. The apparatus of claim 59, wherein the recording layer of the recording medium is formed of alloys of rare earth metal and transition metal.

63. The apparatus of any one of claims 59 through 62, wherein the reaction and diffusion in the recording medium are induced at a temperature of 400-490℃.

64. The apparatus of any one of claims 59 through 63, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of Sb, and a dielectric layer on the recording layer, information is recorded by laser irradiation to induce reaction and diffusion in the recording layer and the protective dielectric layer and change the crystalline structure of the mask layer, so that the recorded information can be reproduced regardless of a diffraction limit.

65. The apparatus of any one of claims 59 through 63, wherein, when the dielectric layer of the recording medium is constructed as a sequential stack of a protective dielectric layer, a mask layer formed of AgO_x, and a dielectric layer on the recording layer, information is

recorded by laser irradiation to induce reaction and diffusion in the recording layer and the protective dielectric layer and decompose the mask layer, so that the recorded information can be reproduced regardless of a diffraction limit.

66. The apparatus of any one of claims 59 through 63, wherein the recording layer and the dielectric layer are simultaneously formed, so that the recording layer and the dielectric layer have a mixed structure including materials for the recording layer and the dielectric layer.